150.01 General

The purpose of Chapter 150 is to describe the project development sequence from the *Washington Transportation Plan* (WTP) through the contract document.

Projects go through a development process to ensure that all elements are considered, that local agencies and the public have an opportunity to comment on the department's proposed action, and that the final product successfully fulfills a transportation need. Changes in project scope, schedule, or budget are reviewed and approved using the Project Control and Reporting Process. Approved changes are reported in the department's quarterly performance report, known as the Gray Notebook.

150.02 References

Revised Code of Washington (RCW) 47.05

Programming and Operations Manual (http://wwwi.wsdot.wa.gov/ppsc/pgmmgt/manual/)

Environmental Procedures Manual – M 31-11, WSDOT

Plans Preparation Manual – M 22-31, WSDOT

*Construction Manua*l – M 41-01, WSDOT

Local Agency Guidelines (LAG) – M 36-63, WSDOThttp://wwwi.wsdot.wa.gov

150.03 Definitions

benefit cost (b/c) ratio A method for prioritizing highway improvement projects. The b/c ratio is determined by dividing measurable benefits by measurable costs for a specific time period; typically 20 years.

Capital Improvement and Preservation Program (CIPP) The Washington State Department of Transportation's (WSDOT's) plan to deliver the program of capital investments in transportation that have been funded in part or in whole by the state Legislature. The CIPP also serves as project documentation relating to the capital budget requests adopted by the Transportation Commission.

capital program management system (CPMS) A mainframe computer database used to develop and manage the highway and marine construction programs. It allows users to establish and maintain project data and is used to manage and deliver statewide construction programs. System screens allow the user to input and maintain project data, manage changes to approved projects, and generate reports to monitor program delivery. CPMS interfaces with the Transportation Information and Planning Support (TRIPS), Priority Array Tracking System (PATS), and Transportation Reporting and Accounting Information System (TRAINS) data bases.

carryforward – federal The apportionment balance, in each federal program, that will be available for the next federal fiscal year. Carryforward consists of the apportionment balance that accumulated and was not used in the three previous federal fiscal years. Unused apportionment is forfeited if it is older than three previous federal fiscal years.

carryforward – state The amount of funds necessary to complete project phases authorized in a previous biennium that will not be available to begin new projects or project phases in a subsequent biennium.

Federal Highway Administration (FHWA) The section of the United States Department of Transportation with jurisdiction over the use of federal transportation funds for state highway and local road and street improvements.

Federal Transit Administration (FTA)
The section of the United States Department of Transportation with jurisdiction over the use of federal funds for financial assistance to develop new transit systems and improve, maintain, and operate existing systems.

Financial Information Retrieval System (FIRS) A computer application that allows the retrieval of accounting and work order information from the Transportation Reporting and Accounting Information System (TRAINS) data base at a "rolled-up" level. For further information, see: http://wwwi.wsdot.wa.gov/FASC/Accounting/firs.pdf.

Geographic Information System (GIS)
A computerized geographic information system used to store data. Data may be used with GIS if the data includes the Accumulated Route Mile (ARM) or State Route Mile Post (SRMP). Global Positioning System (GPS) technology provides a means of collecting data and is an alternative to ARM and SRMP. WSDOT's primary desktop tool to view and analyze GIS data is ArcGIS software.

high accident corridor (HAC) A highway corridor one mile or greater in length where a five-year analysis of collision history indicates that the section has higher than average collision and severity factors.

high accident location (HAL) A highway section typically less than 0.25 mile in length where a two-year analysis of collision history indicates that the section has a significantly higher than average collision and severity rate.

highway construction program (HCP) The comprehensive two-year program and ten-year financial plan of highway improvement and preservation projects selected by priority.

Highway System Plan (HSP) A WSDOT planning document that addresses the state highway system element of the *Washington Transportation Plan* (WTP). The HSP defines the service objectives and the action strategies and costs to maintain, operate, preserve, and improve the state highway system for 20 years. It is the basis for the state highway element for the six-year plan and the biennial state highway construction program. It is periodically updated to reflect completed work, and changing transportation needs, policies, and revenues. It compares highway needs to revenues, describes the "financially constrained" costs of the highway programs, and provides details of conceptual solutions in the improvement program.

Metropolitan Planning Organization (MPO)
A lead agency designated by the Governor to administer the federally-required transportation planning process in a metropolitan area with a population over 50,000. The MPO is responsible for the 20-year long-range plan and *Transportation Improvement Plan* (TIP).

National Highway System (NHS) A network of roadways designated by Congress that consists of all Interstate routes; a large percentage of urban and rural principal arterials; and strategic highways and highway connectors.

pedestrian accident location (PAL) A highway section typically less than 0.25 mile in length where a six-year analysis of accident history indicates that the section has had four accidents in a 0.1 mile segment.

Plans, Specifications, and Estimates (PS&E)
The project development activity that follows project definition and culminates in the completion of contract-ready documents and the Engineer's Cost Estimate. These documents include final plans, specifications, and estimates.

preliminary engineering (PE) A term used to describe the effort needed to arrive at the conceptual solution to address a transportation need, including project establishment and route selection through the PS&E review.

priority array A collection of similar needs identified in the HSP, prioritized based on the methodology adopted by the department to meet the requirements of RCW 47.05.

Priority Array Tracking System (PATS)
A centralized database that allows tracking of highway needs and their solutions. The system is designed to ensure that WSDOT addresses the highest ranked transportation needs. Deficiencies are tracked for each strategy in the HSP.

project control and reporting (PC&R) The Project Control and Reporting office is responsible for monitoring, tracking, and reporting the delivery of the Highway Capital Program in coordination with the Program Management Offices in each of the six WSDOT regions and the Urban Corridors Office.

project summary A document that comprises the project definition, design decisions, and environmental review summary. The document replaces the project prospectus, design report, and environmental database. The project summary ensures that the project scope addresses the need identified in the HSP.

Regional Transportation Planning Organization (RTPO) A planning organization authorized by the Legislature in 1990 as part of the Growth Management Act. The RTPO is a voluntary organization with representatives from state and local governments and is responsible for coordinating transportation planning activities within a region.

Statewide Transportation Improvement Program (STIP) A planning document that includes all federally funded projects and other regionally significant projects for a three-year period. The STIP is a compilation of all projects that are in the TIPs, developed by the regional planning organizations (MPOs and RTPOs). A new STIP must be developed every two years or less, and is approved jointly by the FHWA and FTA for compliance with statutory requirements and financial feasibility.

Surface Transportation Program (STP) A federal program established by Congress in 1991 that provides a source of federal funding for highway and bridge projects.

Transportation Improvement Program (TIP) A three-year transportation improvement strategy required from MPOs by Congress. It includes all projects in the three-year period expected to be financed by federal funds. All federally funded or regionally significant projects must be included in the TIP.

Transportation Information and Planning Support (TRIPS) A mainframe computer system designed to provide engineering, maintenance, planning, and accounting staff with highway inventory, traffic, and accident data.

Washington State Pavement Management System (WSPMS) A computer system that stores data about the condition of all the highways in the state. Information available includes the latest field review, and past contracts for every main line mile of state highway. Calculations are used to determine whether a given section of pavement is a "past due," "due," or "future due" preservation need.

Washington's Transportation Plan (WTP) A WSDOT planning document developed for the Transportation Commission in coordination with local governments, regional agencies, and private transportation providers. It addresses the future of transportation facilities owned and operated by the state and those that the state does not own, but in which it has an interest. It identifies significant transportation investments that are needed. These transportation needs are defined by service objectives and specific desired outcomes for each transportation mode.

150.04 Project Development Sequence

The project development sequence is composed of the following:

(1) Washington State Highway System Plan (HSP)

The HSP is the element of *Washington's Transportation Plan* that addresses the state's highway system. The HSP forecasts transportation needs, provides objectives and action strategies to improve and preserve the highway system, and serves as the basis for the department's capital investment strategies. (To view the *Highway System Plan,* see http://www.wsdot.wa.gov/ppsc/hsp/HSPPlan.htm)

(2) Highway Construction Program

In every odd-numbered year, the Washington State Legislature meets to consider and pass a transportation budget. One piece of this budget is funding for the highway construction program. In order to control expenditures and track budget dollars and commitments, the department groups capital projects into programs, subprograms, and categories based on the action strategies, objectives, and goals in the *Highway System Plan*. The department has identified three subprograms within the preservation program and six subprograms within the improvement program, four of which are discussed in the Improvement Program section.

(a) Prioritizing Project Needs and Solutions

Each category of work within the highway construction program has a set of needs that are identified by comparing a specific action strategy in the *Washington Transportation Plan* to the existing highway system. These needs are met by developing projects to program. The Legislature has directed the department to prioritize (select) projects for each category based on the benefits returned to the transportation user. State law in Priority Programming for State Highways (RCW 47.05) directs WSDOT to identify transportation needs, determine the benefit/cost (b/c) of the solutions, and prioritize the solutions based on the b/c.

(b) Background Information

WSDOT HQ Systems Analysis and Program Development begins the prioritization process for a category of work by identifying the potential benefit(s) associated with solving the need. There are not sufficient resources to analyze the benefits and costs of all needs in each category of the program each biennium, so a prioritization scheme is used to reduce the effort. Because the primary objective of the department's prioritization process is to provide the largest improvement for the least possible cost, needs in each category are ranked based on their potential to provide a benefit. The process includes these steps:

- The regions scope projects to address the needs in rank order. The biennial programming instructions provide guidance to the regions on how far down the ranked "needs lists" to go. To ensure a consistent approach to scoping a project, WSDOT has developed a set of design matrices. Each design matrix sets forth the level of development for a given type of need that would be automatically approved by the department and FHWA. (See Chapters 325 and 340.)
- The regions prepare a cost estimate for the approved scope of work and compare the cost to the potential benefit in order to determine which projects are the most beneficial to construct.

In order to minimize disruptions to the public and take advantage of cost savings, the department may adjust priorities by up to six years.

(c) Building the Program

The basic building blocks for the highway construction program are the project phases in the Capital Improvement and Preservation Program (CIPP). Carryforward project commitments represent job phases that will continue into the next biennium. The book building process starts with these carryforward projects. The regions need to review the carryforward projects and determine the potential for project delays and cost overruns in the current biennium that might affect the next biennium. Maintaining close coordination between the region, HQ Programming, the Project Development Engineer, and the Construction Engineer is necessary to ensure that projects under development and under construction are accomplished as planned.

Building on this foundation, new improvement project phase starts are added based on department policy and Transportation Commission direction. These new project starts represent needs that are identified in the *Highway System Plan*. The first step in adding new projects to the CIPP for the next biennium is to establish a funding target for each category of work within each subprogram. Once HQ has provided the target funding levels, the regions begin to

assemble the highway construction program. It is important to remember that regions can't propose a project unless a need has been identified in the HSP.

After the new projects have been selected and the carryforward projects identified (and their planned expenditures and schedules verified), the program of projects is developed and the project data is input into CPMS for balancing to the target allocations for both dollars and workforce (FTEs). Project summaries are then developed. The program of projects is shared with region executives, and their input is incorporated. Adjustments are made to ensure that the program can be accomplished within the constraints of available workforce and facilities in the region.

(d) Roles and Responsibilities Within WSDOT for Delivering the Highway Construction Program

The WSDOT Budget Office, along with various offices in the Strategic Planning and Programming Division, share responsibility for developing a ten-year capital investment plan for the Commission, including a forecast of available revenue by fund source, and recommend investment levels based on the WTP. Program Development issues programming instructions, based on the preliminary budget targets, which assist the regions as they begin scoping highway projects.

Once a ten-year plan has been determined, and proposed projects scoped, Program Development finalizes a budget request, including a project list that is presented to the Commission for review and submittal to the Legislature. The Legislature sets funding levels for the different programs within the department that will deliver the project list for the funding amount identified in the scoping document.

WSDOT regions, working with support offices, such as Environmental, Utilities, Right of Way, and Construction, design and build the projects that deliver the transportation program.

(e) Categories of Work

The HSP presents the budgets for the Maintenance (M), Operations (Q), Preservation (P), and Improvement (I) programs. Strategies and conceptual solutions are limited to the P & I programs. Each of these programs are broken into sub-programs:

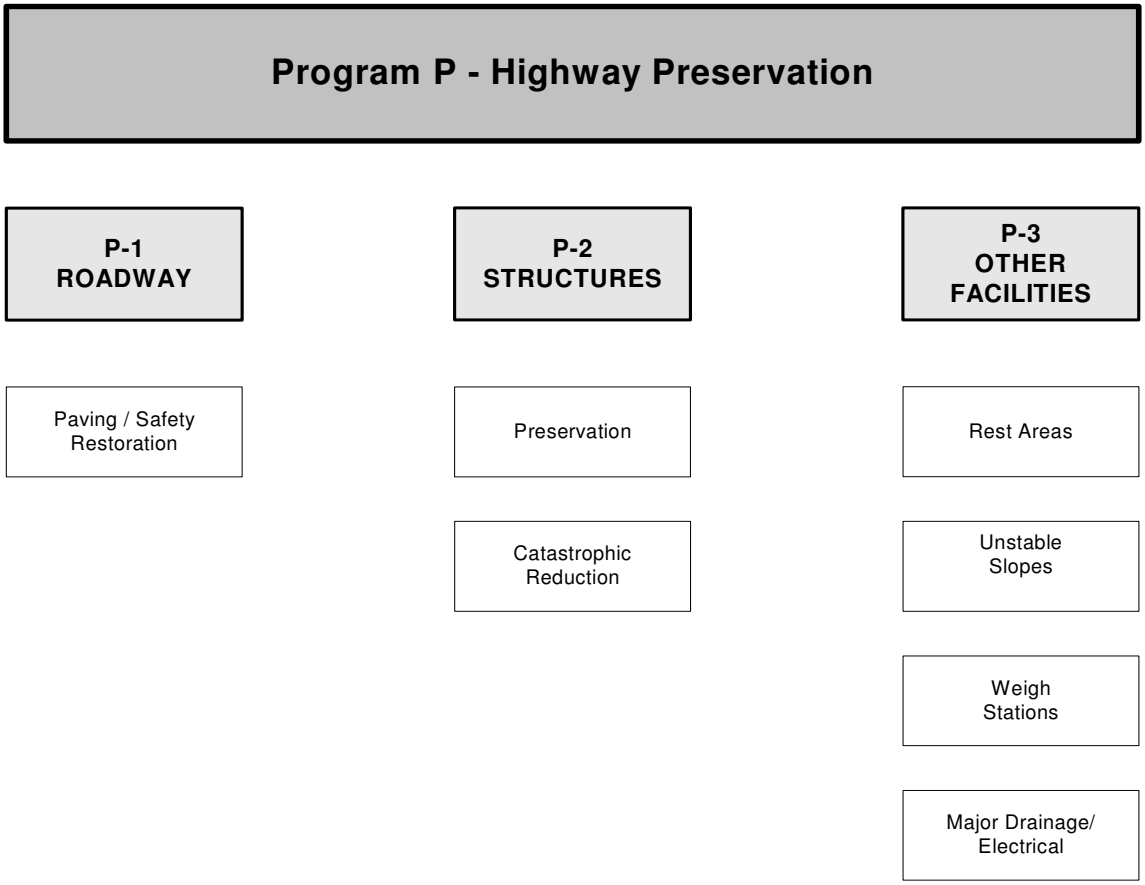

Figure Notes:

Preservation Program (P): Preserve the highway infrastructure cost to effectively protect the public investment.

- **P–1 Paving**

  Repave highways at regular intervals for lowest life cycle cost.

  Restore existing safety features.

- **P–2 Structures**

  Preserve existing structures for operational and structural integrity through rehabilitation or replacement of bridges or other structures.

  Reduce catastrophic failure from naturally occurring events.

- **P–3 Other Facilities**

  Refurbish rest areas to extend service life and improve safety.

  Stabilize known unstable slopes.

  Construct weigh stations to ensure enforcement across the entire highway system.

  Refurbish electrical systems, electronics, and mechanical systems to extend service life and improve safety.

  Rehabilitate or replace existing major drainage features to preserve operational and structural integrity.

Program Elements
Figure 150-1

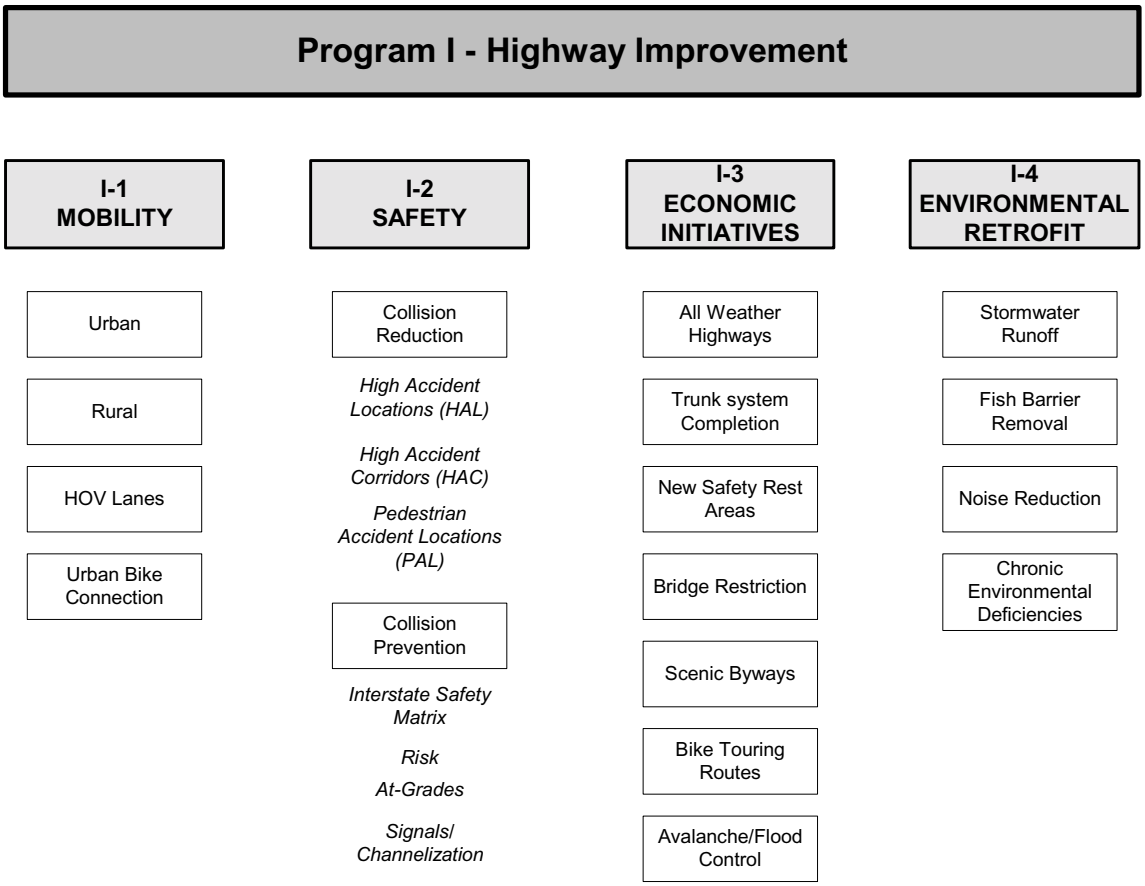

Figure Notes:

Improvement Program (I): Identifies deficiencies in the state highway system and develops solutions for those deficiencies through capital improvement projects.

- **I–1 Mobility**

  Mitigate congestion on urban highways when peak period level of service (LOS) falls below D (Congestion Index 10). For further information, see the *Highway System Plan*, http://www.wsdot.wa.gov/ppsc/hsp/HSPPlan.htm

  Provide uncongested conditions (LOS C-Congestion Index 6) on rural highways.

  Provide bicycle connections on state highways within urban growth areas.

  Complete the Freeway Core HOV Lane system in the Puget Sound region.

- **I–2 Safety**

  Collision Reduction needs include HALs, HACs, and PALs. Needs are ranked based on the societal cost of the accident history. If the Collision Reduction project is programmed within the next six years, regions may combine it with another project to minimize disruption to traffic.

  The needs in Collision Prevention consist of four types: Interstate safety matrix, risk (run off roadway), at-grade intersections, and signals and channelization.

  The needs are prioritized based on the cost benefit of reducing the potential societal cost of accidents, except as noted below.

  The needs in the Interstate safety matrix group are identified by the regions and include any design feature that does not meet the standard specified in the Interstate design matrices. This work is usually done at the same time other work is programmed, such as paving. The needs in the risk (run off roadway) group are identified by HQ Systems Analysis and Program Development, based on roadway and roadside data from the Transportation Data Office. The needs are ranked based on the potential cost of accidents as a result of the existing conditions.

Program Elements

Figure 150-2

At-grade intersections on multilaned, high-speed, access-controlled highways that have a history or the potential for serious accidents are identified by HQ Systems Analysis and Program Development.

The region identifies the needs in the signals and channelization group. Each region is responsible for preparing a prioritized list of needs for locations that meet traffic volume and signal warrants, as detailed in the WSDOT *Traffic Manual*.

Special safety initiative projects are narrowly focused, stand-alone risk reduction projects, such as cable median cross-over barriers and rumble strips.

- **I–3 Economic Initiatives**

  All weather highway needs are identified as those sections of highway that are susceptible to damage by heavy loads when the roadway thaws after a freeze.

  Trunk system completion needs include the state's T-1 freight corridors (highways that carry ten million tons or more of freight each year) identified by HQ Systems Analysis and Program Development and the Transportation Data Office. The Transportation Commission prioritizes these routes.

  The Safety Rest Area Office in the HQ Maintenance and Operations Division works with the regions, specialty groups, and other government agencies to identify locations for new rest areas on state highways and to look for partnership opportunities.

  The Restricted Bridges needs are made up of two types of work: low vertical clearance under-crossings on the Interstate (clearance less than 15 feet 6 inches) and load restricted bridges (licensed legal overloads). The Bridge Planning Section identifies these needs with the technical assistance of the Bridge Condition Section. The low vertical clearance structures on the Interstate have been given priority over the load-restricted structures.

  The Highways and Local Programs Division and the Transportation Data Office have identified where 4-foot bike shoulders do not exist on the state's six rural bicycle-touring routes. The regions look for opportunities to solve these rural bike needs by combining them with programmed work in other categories. This approach minimizes traffic disruption and reduces contract costs.

  HQ Systems Analysis and Program Development has identified roadway segments on T-1 freight corridors (highways that carry ten million tons or more of freight each year) where travelers have experienced delays due to avalanche and flood closures.

- **I–4 Environmental Retrofit**

  Environmental Services (ES) surveys all storm water outfalls that flow into a water body. Each of these storm drains is identified as a need and is further rated from high to low.

  Fish Barrier Removal needs are identified by the Washington State Department of Fish and Wildlife (WDFW). WDFW has surveyed culverts on the state's highway system and identified those that impede the migration of fish. The WDFW is conducting habitat surveys to determine the potential for migratory fish recovery and is prioritizing the culverts based on the results.

  Since 1977, FHWA has funded a program for noise retrofit and made states responsible for mitigating noise-sensitive locations in conjunction with new construction projects. WSDOT's retrofit locations are prioritized based on a b/c ratio.

  The Chronic Environmental Deficiency (CED) Program is a statewide program within WSDOT that works with WSDOT's regional staff to identify and fix locations along highways where recent, frequent, and chronic maintenance and/or repairs to the state transportation infrastructure (highway fills, toe slopes, sanding, etc.) are causing impacts to fish and/or fish habitat.

Program Elements
Figure 150-2 (continued)

(3) Project Summary

The project summary is developed in the region when a project is proposed for programming.

The project summary:

- defines the scope of work HQ Systems Analysis and Program Development and the region have agreed to.
- documents the design decisions made while determining the project scope.
- must be as complete and accurate as possible.
- establishes initial preliminary engineering, right of way, and construction cost estimate.
- documents the project delivery schedule.
- requires approval by HQ Systems Analysis and Program Development prior to beginning work on a project.
- documents the potential environmental impacts and permits that may be required.

The intent of this agreement is to identify the need that has generated the project and the proposed solution that will solve that need.

Regions are encouraged to place special emphasis on project scoping, estimating, and scheduling during program development to ensure program delivery stays within appropriated dollars and workforce. Resources available to the regions include the *Highway System Plan*; Route Development Plans; the Design Matrix; the *Roadside Classification Plan*; Environmental Workbench and other planning; and design and environmental documents to ensure that project scoping is consistent.

The environmental section of the project summary establishes the initial environmental classification and documentation required for the project. Environmental classification at the project summary stage has several benefits. It helps in understanding the impacts associated with a project and it helps to establish a realistic schedule and PE cost estimate. All projects require supporting State Environmental Policy Act (SEPA) documentation. National Environmental Policy Act (NEPA) documentation is also required for all projects that are eligible for federal funding.

Regions are encouraged to take full advantage of expertise available from the HQ Systems Analysis and Program Development Branch of the Strategic Planning and Programming Division, FHWA, the Environmental Office, and local agencies when scoping projects to ensure that all aspects are considered, and that the proposed solution is eligible for available funding. These resources can help the regions evaluate a project's impacts and provide the appropriate project direction.

HQ Systems Analysis and Program Development coordinates review of the project summary and forwards any comments to the regions for resolution prior to approval. Once all comments and outstanding issues are resolved, the project summary can be approved and copies distributed.

(4) Environmental Document

The Environmental Document is a statement identifying impacts to the natural and manmade environment as a result of a project. The statement may consist of one or two pages for categorically exempted projects, a SEPA checklist, or an environmental impact statement (EIS) for major projects. (See Chapter 220.)

(5) Design Documentation Package (DDP)

The DDP is a formal document of design considerations and conclusions reached in the development of a project. The Project File records various design recommendations that are reviewed within the department and, when approved, become the project design. (See Chapter 330.)

(6) Right of Way/Access Plans

Right of Way/Access Plans are the official state documents used to acquire real estate, property, and access rights. These plans determine rights of access from abutting property owners, interchange or intersection spacing, access points per mile, or other selective approaches to a highway facility. Right of way plans are used to obtain the "Order of Public Use and Necessity," which is the authority to acquire real property and property rights under eminent domain.

The establishment of access control is considered whenever major improvements, reconstruction, relocation, significant new rights of way, or new facilities are required. Projects not requiring right of way or other property interests skip this phase of project development. (See Chapters 1420, 1430, 1435 and the *Plans Preparation Manual*, M 22-31.)

(7) Contract Document

The contract Plans, Specifications, and Estimates (PS&E) are the final documents required for the advertisement of a construction contract. Contract plans must conform to the basic design features approved in the project summary, environmental documents, and the DDP. The plans and contract specifications must set forth the work in a clear and concise manner to avoid misinterpretation. A tool available to the designer to ensure that required items are addressed during the PS&E preparation is the "PS&E Review Checklist," available on the WSDOT intranet. Projects may go through PS&E preparation, but will not be advertised for construction until all previous phases are complete. (See the *Plans Preparation Manual,* M 22-31.)